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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,914	12/14/2004	Marcello Leonardo Mario Balistreri	NL 030229	8897

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EXAMINER	
VERDERAME, ANNA L	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
11/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,914	BALISTRERI ET AL.	
	Examiner	Art Unit	
	Anna L. Verderame	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/23/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 7 is objected to because of the following informalities: LC should be replaced with "liquid crystal". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 20 and 21 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 20 recites a storage medium according to claim 18 wherein the polymer material comprises a singular polymer layer. Claim 21 recites a storage medium according to claim 18 wherein the polymer material comprises a multiple of polymer layers. It is believed that these claims are meant to recite a single polymer recording layer embodiment and an embodiment in which multiple polymer recording layers are formed. Claim 20 should be amended to recite " a storage medium according to claim 18 comprising a singular polymer layer". Claim 21 should be amended to recite " a storage medium according to claim 18 comprising two or more polymer layers".

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5,8-20, and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Eich et al. 5,024,784 in view of Coles et al. 4,702,558.

Eich et al. teaches a recording medium comprising a polymer shown at (17/30-35) formed on transparent plates. The recording cell was placed in a heating block and **heated** to a temperature 10° below the temperature of transition from the liquid crystalline state to the isotropic phase. **Light** from an argon laser with a wavelength of 514.5 nm is used to locally heat the polymer. After turning off the laser beam the local disorientation is frozen in a glassy state(17/40-60). In claim 6, Eich et al. recites the limitation that the writing step is performed by illuminating the polymer film with a laser beam of suitable wavelength and intensity and said reading step is performed by a second laser beam having a different wavelength, whereby the stored information is not disturbed(19/15-21).

The orientation is carried out in a known way by applying an oriented field(alignment field) particularly a magnetic field and specifically an electrical field, or by

surface effects(instant claim 10). The necessary orientation is conducted above the glass transition temperature. Cooling while retaining the applied voltage results in the formation of an oriented film(14/1-10). The polymer according to this invention requires the presence of at least one type of photochromic group in the storage medium. This can be met by incorporating monomers containing such photochromic groups or by adding compounds that have photochromic groups to the liquid crystalline polymer. Photochromic groups that are suitable for use include azobenzene, azoxybenzene, and stilbene (6/14-32). Medium is described at (13/35-51). Addition of dye molecules is taught at (16/6-15). Dyes may be components of the liquid crystal polymer or they can be admixed into the storage medium and distributed in it.

Eich et al. does not teach use of fluorescent dyes in recording media containing polymeric recording layers.

Coles et al teaches addition of fluorescent dyes to polymeric recording films. Fluorescent dyes are also aligned by the reorientation process and give rise to bright displays(13/15-37). Use of **nanosecond pulses** in polymeric recording layers containing fluorescent dyes is disclosed at (13/35-36). General description of the recording medium is taught at (13/63-14/10). In regard to claim 22, fluorescent dyes work by absorbing light at a specific wavelength and re-emission at a different wavelength(12/60-62). Claim 18 discusses the use of the laser beam as a heating means and as a means to optically address.

It would have been obvious to one of ordinary skill in the art to modify the polymeric liquid crystal storage device and method for recording disclosed by Eich et al.

by incorporating a fluorescent dye into the polymeric recording layer comprising a polymer having a photochromic group such as azobenzene azoxybenzene or stilbene, based on the disclosure to add a dye in Eich et al. at (16/6-15) and based on the addition of fluorescent dyes to a polymeric recording layer by Coles et al., with the reasonable expectation of achieving the benefits disclosed by Coles et al. at (13/15-37). Further, it would be obvious to read the medium described above by exploiting the inherent property of the fluorescent dyes and illuminating the recording layer with light of a particular wavelength and collecting the emission of the dye which occurs at a wavelength different than that absorbed by the dye.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eich et al. 5,024,784 in view of Coles et al. 4,702,558 as applied above, and further in view of Fukuda et al. 2002/0034693.

Coles et al. discussed the use of a single laser beam as a heating means and as a means of optically addressing(initializing change in the polymer film). However, the combination of Eich et al. in view of Coles et al. does not teach a method where initiating is performed by a first beam and heating is achieved by a second beam.

Fukuda et al. teaches an improvement in an optical information recording method comprising the formation of a polymeric film, having a chemical structure of azobenzene with a first beam falling in a first irradiation spot on the polymeric thin film to effect a morphological change of the polymeric film, the improvement comprises simultaneously irradiating the polymeric thin film patternwise with a second light beam of substantially the same wavelength as the first light beam falling in a second

irradiation spot, the diameter of the second irradiation spot being larger than the diameter of the first irradiation spot and the second irradiation spot enveloping the first irradiation spot(claim 1). Figure 2 shows the distribution of irradiance in the radial direction within the irradiation spots formed by the first and second light beams respectively(0025). Irradiance by the first beam is in the range of from 1 to 500 mW/cm^2 and the irradiance of the second beam is in the range of from 10 to 200 mW/cm^2(0028). The effect of this improved recording method is an increase in sensitivity and an increase in the velocity at which the morphological change occurs in the polymeric film(abstract and 0005).

The examiner notes that recording in a polymeric film using two beams is shown by Fukuda et al. Claim 6 of the instant claims recites that the first beam is used for initiating and the second beam is used for heating. This is read as an intended use. Further, the term initializing could be interpreted to be a heating step. The polymer needs to be heated to a temperature above the glass transition temperature before reorientation can occur. Then the molecules need to be maintained at that temperature for a certain amount of time before the film is cooled. The first heating step could be interpreted as an initialization step. The applicant has the burden to show that the two beam method of the instant application is distinct from that shown in the prior art.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the recording medium taught by Eich et al. in view of Coles et al. by forming a polymeric recording layer having azobenzene as a photochromic group and having a fluorescent dye, and recording the polymeric recording layer using the

improved two-beam method taught by Fukuda et al. based on the use of the improved method on a polymeric recording layer having a chemical structure of azobenzene by Fukuda et al. and with the reasonable expectation of achieving increased sensitivity and an increase in the velocity at which the morphological change occurs in the polymeric recording film as disclosed by Fukuda et al. in the abstract and at (0005).

7. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eich et al. 5,024,784 in view of Coles et al. 4,702,558 as applied above and further in view of Ishii et al. 6,940,801.

The combination of Eich et al. in view of Coles et al. does not disclose a recording medium comprising multiple polymer recording films.

In claim 1, Ishii et al. recites a optical recording medium comprising **at least one** recording layer, the optical recording layer including a material that changes a state of photoinduced birefringence in response to recording light. Polymer film containing azobenzene may be used as a material(5/60-6/43).

It would have been obvious to modify the recording medium of Eich et al. in view of Coles et al. by forming media having two or more recording layers based on the disclosure of media having **at least one** by Ishii et al. and with the reasonable expectation of obtaining the obvious benefit increasing the recording capacity of the medium by increasing the number of recording layers in the medium.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eich et al. 5,024,784 in view of Coles et al. 4,702,558 as applied above and further in view of Asher et al. 6,589,452.

The combination of Eich et al. in view of Coles et al. does not disclose the limitations of instant claim 7.

Asher et al. teaches a polymer containing a photo chromic molecule wherein the photochromic molecule is selected from the group consisting of azobenzene and others(18/27-31). Asher teaches that the trans-cis photoconversion of azobenzene, which occurs in the picosecond time range in solution. This isomerism is responsible for the change in optical properties in the polymeric film containing the photochromic molecule. Asher goes on to disclose the use of UV irradiation in a time scale range from about picoseconds to about seconds and more preferably nanoseconds to milliseconds in order to cause this isomerization(8/55-9/7).

The examiner holds that the length of the first irradiation need only be long enough to cause the photochromic group to undergo an isomerization. The applied field holds the molecule in this state while the irradiated portion is allowed to cool.

It would have been obvious to one of ordinary skill in the art to modify the method of recording disclosed by Eich et al. by irradiating the polymer film taught by Eich et al. in view of Coles et al., comprising azobenzene as the photochromic group and a fluorescent dye, for a time period in the nanosecond to millisecond range based on the disclosure in Eich et al. that the irradiation step serves the purpose of orienting(causing an isomerization of) the photochromic molecule and based on the disclosure in Asher et al. that the isomerization of azobenzene can be caused by UV irradiation in a time scale range of nanoseconds to milliseconds.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-Gu et al. 2004/0066728

-5,384,221- (25/39-45) nanosecond pulses

-6,027,849

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna L. Verderame whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALV

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